

GCTTCCCGAGGCTCCGCACCAGCCGCGCTTCTGTCCGCCTGCAGGGCATTCCA  
GAAAGATGAGGATATTTGCTGTCTTTATATTCATGACCTACTGGCATTGCTG  
AACGCATTTACTGTACGGTTCCCAAGGACCTATATGTGGTAGAGTATGGTA  
GCAATATGACAATTGAATGCAAATCCCAGTAGAAAAACAATTAGACCTGGC  
TGCACTAATTGTCTATTGGGAAATGGAGGATAAGAACATTATTCAATTTGTGC  
ATGGAGAGGAAGACCTGAAGGTTTCAGCATAGTAGCTACAGACAGAGGGCCC  
GGCTGTTGAAGGACCAGCTCTCCCTGGGAAATGCTGCACTTCAGATCACAGA  
TGTGAAATTGCAGGATGCAGGGGTGTACCGCTGCATGATCAGCTATGGTGCT  
GCCGACTACAAGCGAATTACTGTGAAAGTCAATGCCCCATACAACAAAATCA  
ACCAAAGAATTTTGGTTGTGGATCCAGTCACCTCTGAACATGAACTGACATGT  
CAGGCTGAGGGCTACCCCAAGGCCGAAGTCATCTGGACAAGCAGTGACCATC  
AAGTCCTGAGTGGTAAGACCACCACCACCAATTCCAAGAGAGAGGAGAAGC  
TTTTCAATGTGACCAGCACACTGAGAATCAACACAACAACTAATGAGATTTT  
CTACTGCACTTTTAGGAGATTAGATCCTGAGGAAAACCATACAGCTGAATTG  
GTCATCCCAGGTAATATTCTGAATGTGTCCATTAAAATATGTCTAACACTGTC  
CCCTAGCACCTAGCATGATGTCTGCCTATCATAGTCATTTCAGTGATTGTTGAA  
TAAATGAATGAATGAATAACACTATGTTTACAAAATATATCCTAATTCCTCAC  
CTCCATTCATCCAAACCATATTGTTACTTAATAAACATTCAGCAGATATTTAT  
GGAATAAAAAAAAAAAAAAAAAAAAAA

FIGURE 1

CGAGGCTCCGCACCAGCCGCGCTTCTGTCCGCCTGCAGGGCATTCCAGAAAGA  
 TGAGGATATTTGCTGTCTTTATATTCATGACCTACTGGCATTGCTGAACGCATT  
 TACTGTACGGTTCCCAAGGACCTATATGTGGTAGAGTATGGTAGCAATATGAC  
 AATTGAATGCAAATTCACAGTAGAAAAACAATTAGACCTGGCTGCACTAATTGT  
 CTATTGGGAAATGGAGGATAAGAACATTATTCAATTTGTGCATGGAGAGGAAG  
 ACCTGAAGGTTACAGCATAGTAGCTACAGACAGAGGGCCCGCTGTTGAAGGAC  
 CAGCTCTCCCTGGGAAATGCTGCACCTCAGATCACAGATGTGAAATTGCAGGAT  
 GCAGGGGTGTACCGCTGCATGATCAGCTATGGTGGTGCCGACTACAAGCGAAT  
 TACTGTGAAAGTCAATGCCCCATACAACAAAATCAACCAAAGAATTTTGGTTGT  
 GGATCCAGTCACCTCTGAACATGAACTGACATGTCAGGCTGAGGGCTACCCCA  
 AGGCCGAAGTCATCTGGACAAGCAGTGACCATCAAGTCCTGAGTGGTAAGACC  
 ACCACCACCAATTCCAAGAGAGAGGAGAAGCTTTTCAATGTGACCAGCACACT  
 GAGAATCAACACAACAATAATGAGATTTTCTACTGCACTTTTAGGAGATTAGA  
 TCCTGAGGAAAACCATACAGCTGAATTGGTCATCCCAGAACTACCTCTGGCACA  
 TCCTCCAAATGAAAGGACTCACTTGGTAATTCTGGGAGCCATCTTATTATGCCTT  
 GGTGTAGCACTGACATTCATCTTCCGTTTAAGAAAAGGGAGAATGATGGATGT  
 GAAAAAATGTGGCATCCAAGATACAACTCAAAGAAGCAAAGTGATACACATTT  
 GGAGGAGACGTAATCCAGCATTGGAACCTTCTGATCTTCAAGCAGGGATTCTCA  
 ACCTGTGGTTTAGGGGTTTCATCGGGGCTGAGCGTGACAAGAGGAAGGAATGG  
 GCCCGTGGGATGCAGGCAATGTGGGACTTAAAAGGCCCAAGCACTGAAAATG  
 GAACCTGGCGAAAGCAGAGGAGGAGAATGAAGAAAGATGGAGTCAAACAGGG  
 AGCCTGGAGGGAGACCTTGATACTTTCAAATGCCTGAGGGGCTCATCGACGCC  
 TGTGACAGGGAGAAAGGATACTTCTGAACAAGGAGCCTCCAAGCAAATCATCC  
 ATTGCTCATCTAGGAAGACGGGTGAGAATCCCTAATTTGAGGGTCAGTTCCT  
 GCAGAAGTGCCCTTTCCTCCACTCAATGCCTCAATTTGTTTTCTGCATGACTGA  
 GAGTCTCAGTGTTGGAACGGGACAGTATTTATGTATGAGTTTTTCCTATTTATTT  
 TGAGTCTGTGAGGTCTTCTTGTGATGTGAGTGTGGTTGTGAATGATTTCTTTGA  
 AGATATATGTAGTAGATGTTACAATTTTGTGCGCCAACTAAACTTGCTGCTTAA  
 TGATTTGCTCACATCTAGTAAAACATGGAGTATTTGTAAAAAAAAAAAAAAAA

FIGURE 2

## 292 secreted (245 amino acids)

Signal/IgV/IgC/hydrophilic tail  
(a) (b) (c) (d)

Ig cysteines in large bold

MRIFAVFIFMTYWHLNA (signal)

FTVTPKDLVVEYGSNMTIECKFPVEKQLDLAALIVWEMEDKN  
IIQFVHGEECLKVQHSSYRQRARLLKQQLSLGNAALQITDVKLQD  
AGVYRCMISYGGADYKRITVKVNAPY (IgV)

NKINQRILVVDPTSEHETCQAEYCPKAEVIWTSSDHQVLSGKT  
TTTNSKREEKLFNVTSTLRINTTTNEIFYCTFRRLDPEENHTAEL  
VIP (IgC)

GNILNVSIKICLTLPST (hydrophilic tail)

FIGURE 3

## 292 membrane (290 amino acids)

Signal/IgV/IgC/transmembrane (underlined)  
plus cytoplasmic

Ig cysteines in large bold

MRIFAVFIFMTYWHLLNA (signal)

FTVTPKDLVVEYGSNMTIE**C**KFPVEKQLDLAALIVYWEMEDKN  
IIQFVHGEEEDLKVQHSSYRQARLLKDQSLGNAALQITDVKLQD  
AGVYR**C**MISYGGADYKRITVKVNAPY (IgV)

NKINQRILVDPVTSEHELT**C**QAEYKPAEVIWTSSDHQVLSGKT  
TTNSKREEKLFNVTSTLRINTTNEIFY**C**TFRRLDPEENHTAEL  
VIP (IgC)

ELPLAHPNERTHLVILGAILLCLGVALTFIFRLRKGRMDVKKC  
GIQDTNSKKQSDTHLEET (transmembrane plus cytoplasmic)

FIGURE 4

AGATAGTTCCCAAACATGAGGATATTTGCTGGCATTATATTCACAGCCTGC  
 TGTCACCTTGCTACGGGCGTTTACTATCACGGCTCCAAAGGACTTGTACGTG  
 GTGGAGTATGGCAGCAACGTACGATGGAGTGCAGATTCCCTGTAGAACG  
 GGAGCTGGACCTGCTTGCGTTAGTGGTGTACTGGGAAAAGGAAGATGAGC  
 AAGTGATTCAGTTTGTGGCAGGAGAGGAGGACCTTAAGCCTCAGCACAGCA  
 ACTTCAGGGGGAGAGCCTCGCTGCCAAAGGACCAGCTTTTGAAGGGAAAT  
 GCTGCCCTTCAGATCACAGACGTCAAGCTGCAGGACGCAGGCGTTTACTGC  
 TGCATAATCAGCTACGGTGGTGCGGACTACAAGCGAATCACGCTGAAAGTC  
 AATGCCCCATACCGCAAATCAACCAGAGAATTTCCGTGGATCCAGCCACTT  
 CTGAGCATGAACTAATATGTACAGGCCGAGGGTTATCCAGAAGCTGAGGTAA  
 TCTGGACAAACAGTGACCACCAACCCGTGAGTGGGAAGAGAAGTGTACCA  
 CTTCCCGGACAGAGGGGATGCTTCTCAATGTGACCAGCAGTCTGAGGGTCA  
 ACGCCACAGCGAATGATGTTTTCTACTGTACGTTTTGGAGATCACAGCCAG  
 GGCAAACACACAGCGGAGCTGATCATCCAGAACTGCCTGCAACACATC  
 CTCCACAGAACAGGACTCACTGGGTGCTTCTGGGATCCATCCTGTTGTTCC  
 TCATTGTAGTGTCCACGGTCCTCCTCTTCTTGAGAAAACAAGTGAGAATGCT  
 AGATGTGGAGAAATGTGGCGTTGAAGATACAAGCTCAAAAAACCGAAATGA  
 TACACAATTCGAGGAGACGTAAGCAGTGTTGAACCCTCTGATCGTCGATTG  
 GCAGCTTGTGGTCTGTGAAAGAAAGGGCCCATGGGACATGAGTCCAAAGAC  
 TCAAGATGGAACCTGAGGGAGAGAACCAAGAAAGTGTTGGGAGAGGAGCC  
 TGGAACAACGGACATTTTTTCCAGGGAGACACTGCTAAGCAAGTTGCCCAT  
 CAGTCGTCTTGGGAAATGGATTGAGGGTTCCTGGCTTAGCAGCTGGTCCTT  
 GCACAGTGACCTTTTCTCTGCTCAGTGCCGGGATGAGAGATGGAGTCATG  
 AGTGTGGAAGAATAAGTGCCCTTCTATTTATTTTGAAGTCTGTGTGTTCTCACTT  
 TGGGCATGTAATTATGACTGGTGAATTCTGACGACATGATAGATCTTAAGAT  
 GTAGTCACCAAACCTCAACTGCTGCTTAGCATCCTCCGTAACCTACTGATACAA  
 GCAGGGAACACAGAGGTCACCTGCTTGGTTTGACAGGCTCTTGCTGTCTGA  
 CTCAAATAATCTTTATTTTTTCAAGTCTCAAGGCTCTTCGATAGCAGTTGTTCT  
 GTATCAGCCTTATAGGTGTCAGGTATAGCACTCAACATCTCATCTCATTACA  
 ATAGCAACCCTCATCACCATAGCAACAGCTAACCTCTGTTATCCTCACTTCA  
 TAGCCAGGAAGCTGAGCGACTAAGTCACTTGCCACAGAGTATCAGCTCTC  
 AGATTTCTGTTCTTCAGCCACTGTCCTTTTCAAGGATAGAATTTGTCGTTAAGAA  
 ATTAATTTAAAACTGATTATTGAGTAGCATTGTATATCAATCACAACATGCC  
 TTGTGCACTGTGCTGGCCTCTGAGCATAAAGATGTACGCCGGAGTACCGGT  
 CGGACATGTTTATGTGTGTTAAATACTCAGAGAAATGTTCAATTAACAAGGAG  
 CTTGCATTTTAGAGACACTGGAAAGTAACTCCAGTTTATTGTCTAGCATTAC  
 ATTTACCTCATTTGCTATCCTTGCCATACAGTCTCTTGTTCTCCATGAAGTGT  
 CATGAATCTTGTTGAATAGTTCTTTTATTTTTTAAATGTTTCTATTTAAATGATA  
 TTGACATCTGAGGCGATAGCTCAGTTGGTAAAACCTTTTCTCACAAGTGTG  
 AAACCTGAGTCTTATCCCTAGAACCCACATAAAAAACAGTTGCGTATGTTT  
 GTGCATGCTTTTGATCCCAGCACTAGGGAGGCAGAGGCAGGCAGATCCTG  
 AGCTCTCATTGACCACCCAGCCTAGCCTACATGGTTAGCTCCAGGCCTACA  
 GGAGCTGGCAGAGCCTGAAAAACGATGCCTAGACACACACACACACACACA  
 CACACACACACACACACACACACACACCATGTACTCATAGACCTAAGTGCACC  
 CTCCTACACATGCACACACATACAATTCAAACACAAATCAACAGGGGAATTGT

Figure 5

CTCAGAATGGTCCCCAAGACAAAGAAGAAGAAAAACACCAAACCAGCTCTA  
 TTCCCTCAGCCTATCCTCTCTACTCCTTCCTAGAAGCAACTACTATTGTTTT  
 GTATATAAATTTACCCAACGACAGTTAATATGTAGAATATATATTAAAGTGTC  
 TGTCAATATATATTATCTCTTTCTTTCTTTCTTCCTTTCTTTCTTTCTTTCT  
 TTTCTTTCTTTCTTTCTTTCTTTCTTTCTTTCTTTCTTTCTTTCTTTCTTTCT  
 CTTCCTTCCTTCCTTTCTTTCTTTCTTTCTTTCTTTCTTTCTTTCTTTCTTTCT  
 TGGTTGCTCACTATGCATTTTCTGTGCTCTTCGCCCTTTTATTTAATGTATG  
 GATATTTATGCTGCTTCCAGAATGGATCTAAAGCTCTTTGTTTCTAGGTTTTCT  
 TCCCCCATCCTTCTAGGCATCTCTCACACTGTCTAGGCCAGACACCATGTCT  
 GCTGCCTGAATCTGTAGACACCATTTATAAAGCACGTACTACCGAGTTTGT  
 ATTTGGCTTGTTCTGTGTCTGATTAAAGGGAGACCATGAGTCCCCAGGGTA  
 CACTGAGTTACCCAGTACCAAGGGGGAGCCTTGTTTGTGTCTCCATGGCA  
 GAAGCAGGCCTGGAGCCATTTTGGTTTCTTCCTTGACTTCTCTCAAACACAG  
 ACGCCTCACTTGCTCATTACAGGTTCTCCTTTGGGAATGTCAGCATTGCTCC  
 TTGACTGCTGGCTGCCCTGGAAGGAGCCCATTAGCTCTGTGTGAGCCCTTG  
 ACAGCTACTGCCTCTCCTTACCACAGGGGGCCTCTAAGATACTGTTACCTAGA  
 GGTCTTGAGGATCTGTGTTCTCTGGGGGGAGGAAAGGAGGAGGAACCCAG  
 A'ACTTTCTTACAGTTTTCTTGTTCTGTACATGTCAAGACTGAAGGAACAG  
 GCTGGGCTACGTAGTGAGATCCTGTCTCAAAGGAAAGACGAGCATAGCCGA  
 ACCCCCGGTGGAACCCCTCTGTTACCTGTTACACACAAGCTTATTGATGAGT  
 CTCATGTTAATGTCTTGTTTGTATGAAGTTTAAGAAAATATCGGGTTGGGCAA  
 CACATTCTATTTATTCATTTTATTTGAAATCTTAATGCCATCTCATGGTGTTGG  
 ATTGGTGTGGCACTTTATTCTTTTGTGTTGTGTATAACCATAAATTTTATTTTG  
 CATCAGATTGTCAATGTATTGCATTAATTTAATAAATATTTTATTTATTAATAA  
 AAAAAAAAAAAAAA

Figure 5  
(continued)

MRIFAGIIFTACCHLLRAFTITAPKDLYVVEYGSNVTMECRFPVERELDLLALVYWEKEDEQVIQFVAGEE  
DLKPQHSNFRGRASLPKDQLLKGNAAALQITDVKLQDAGVYCCIIISYGGADYKRITLKVNAPYRKINQRISV  
DPATSEHELICQAEGYPEAEVIWTNSDHQPVSGKRSVTTSRTEGMLLNVTSSLRVNATANDVFYCTFWR  
SQPGQNHTAELIPELPATHPPQNRTHWLLGSILLFLIVVSTVLLFLRKQVRMLDVEKCGVEDTSSKNRN  
DTQFEET.

40024004

Figure 6

mB7H vs. hB7-4

69% identity

mB7-4 1 MRIFAGIIFTACCHLLRAFTITAPKDLVVVEYGSNVMECRFPVERELDLLALVVWEKE 60  
 MRIFA IF HLL AFT+T PKDLVVVEYGSN+T+EC+FPVE++LDL AL+VYWE E  
 hB7-4 1 MRIFAVFIFMTYWHLLNAFTVTVPKDLVVVEYGSNMTIECKFPVEKQLDLAALIVYWE 60  
 DEQVIQFVAGEEDLKQHSNFRGRASLPKDQLKGNAAALQITDVKLQDAGVYCCIISYGG 120  
 D+ +IQFV GEEDLK QHS++R RA L KDQL GNAALQITDVKLQDAGVY C+ISYGG  
 hB7-4 61 DKNIIQFVHGEEDLKQVHSSYRQARLLKDQLSLGNAALQITDVKLQDAGVYRCMISYGG 120  
 ADYKRITLKVNPYRKINQRI-SVDPATSEHELICQAEGYPEAEVIWTSNDHQPVSGKRS 179  
 ADYKRIT+KVNAPY KINQRI VDP TSEHEL CQAEGYP+AEVIWT+SDHQ +SGK +  
 hB7-4 121 ADYKRITVKVNAPYKINQRIILVDPVTSEHELTCQAEGYPKAEVIWTSNDHQVLSGKTT 180  
 VTTSRTEGMLLVNTSSLRVNATANDVFYCTFWRSPQGNHTAELIIPELPATHPPQNRTH 239  
 T S+ E L NVTS+LR+N T N++FYCTF R P +NHTAEL+IPELP HPP RTH  
 hB7-4 181 TTNSKREEKLFNVTSTLRINTTTTNEIFYCTFRRLDPEENHTAELVIPLELAHPPNERTH 240  
 WVLLGSILLFLIVVSTVLLFLRKQVRMLDVEKCGVEDTSSKNRNDTQFEET 290  
 V+LG+ILL L V T + LRK RM+DV+KCG++DT+SK ++DT EET  
 hB7-4 241 LVILGAILLCGVALTFIFRLRKG-RMMDVKKCGIQDTNSKKQSDTHLEET 290

Figure 7

9/13

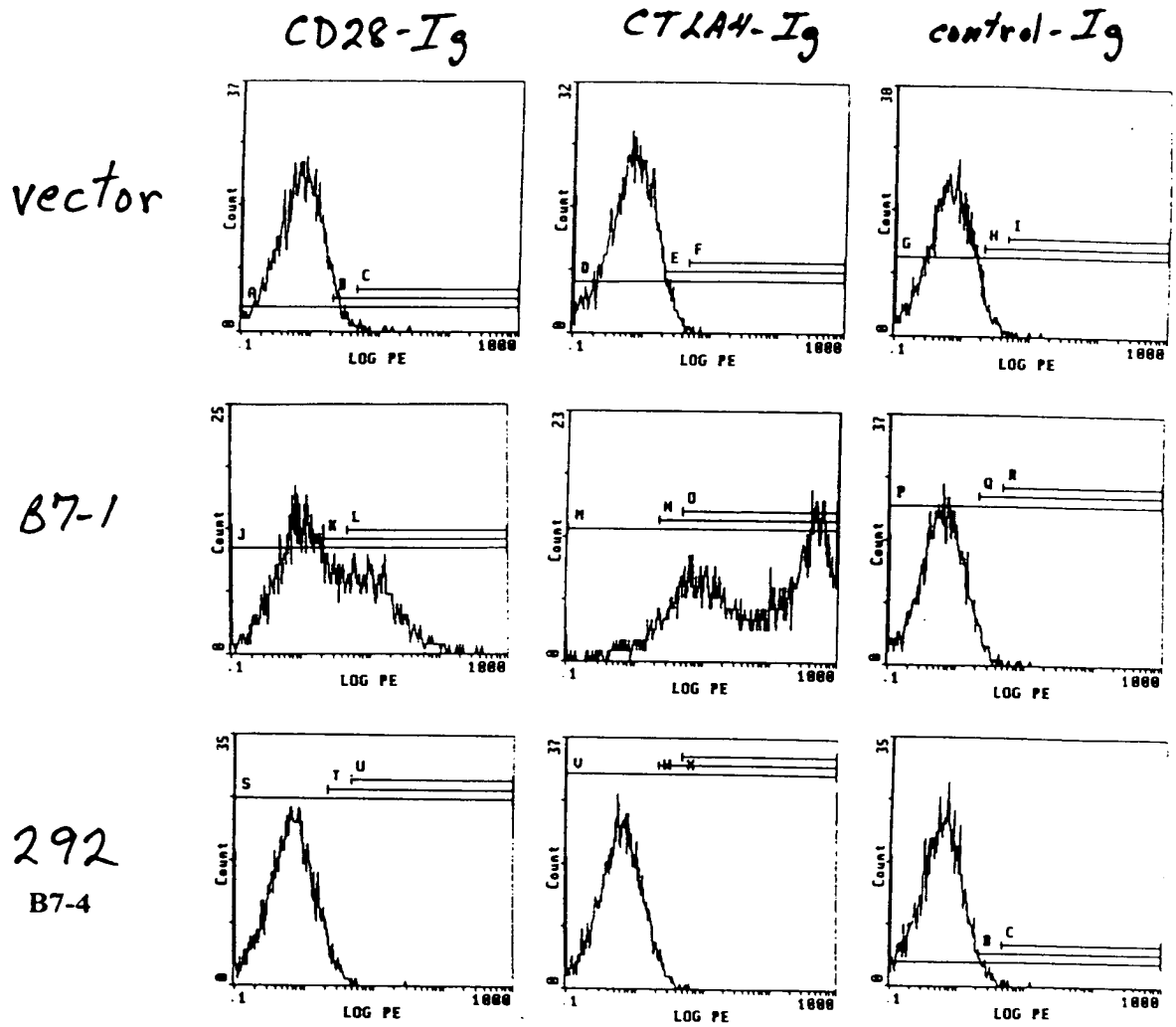
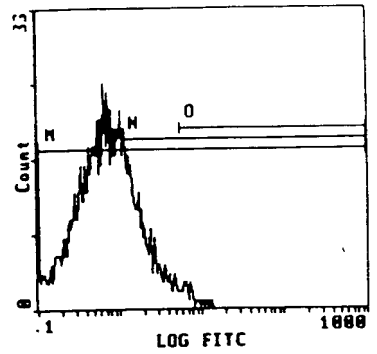
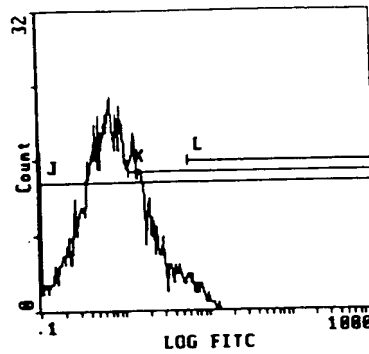


Figure 8

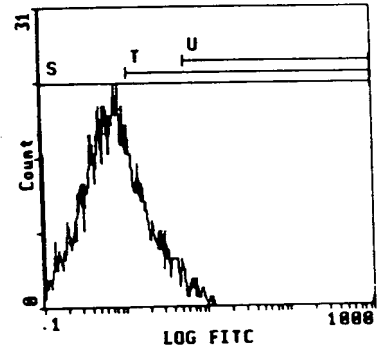
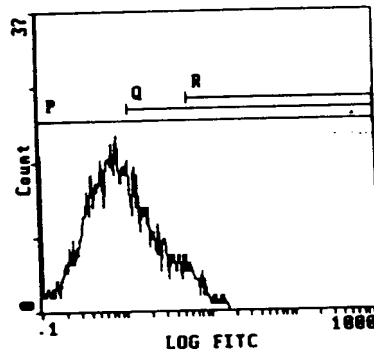
IgG

mICOS - His

vector



B7-1



292

B7-4

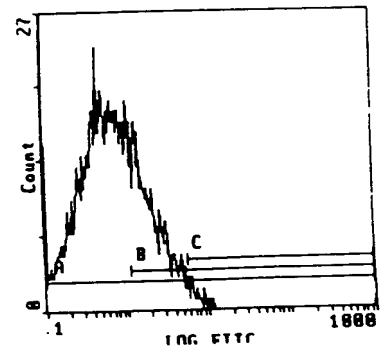
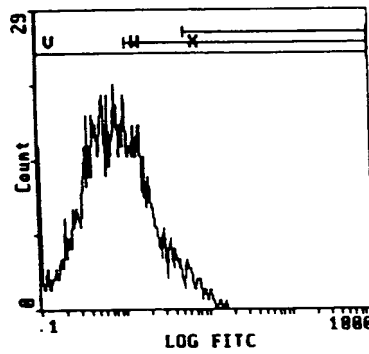


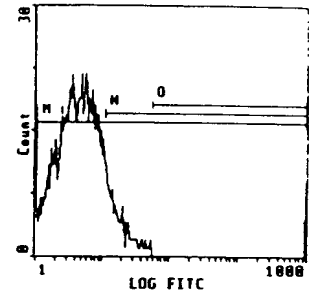
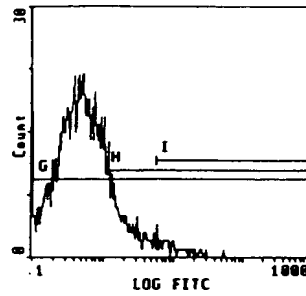
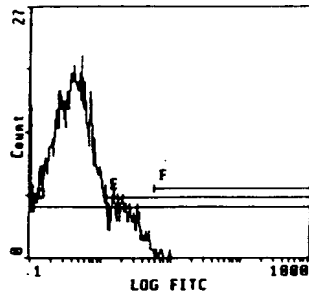
Figure 9

*IgM*

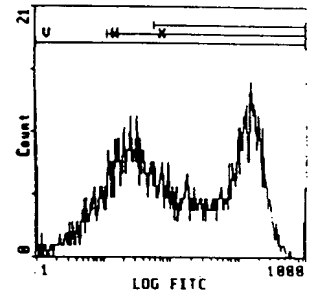
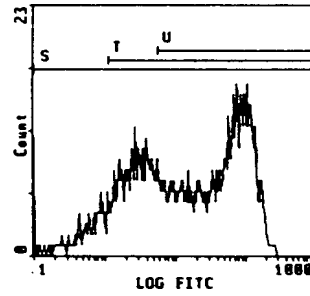
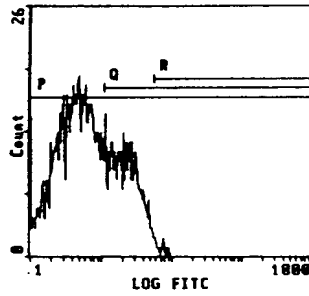
*BBI*

*133*

*vector*



*B7-1*



*292*  
*B7-4*

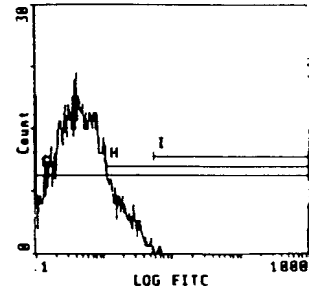
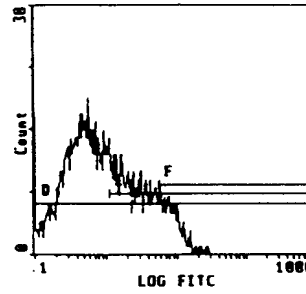
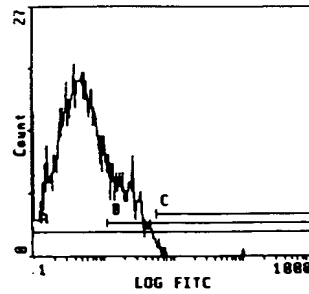


Figure 10

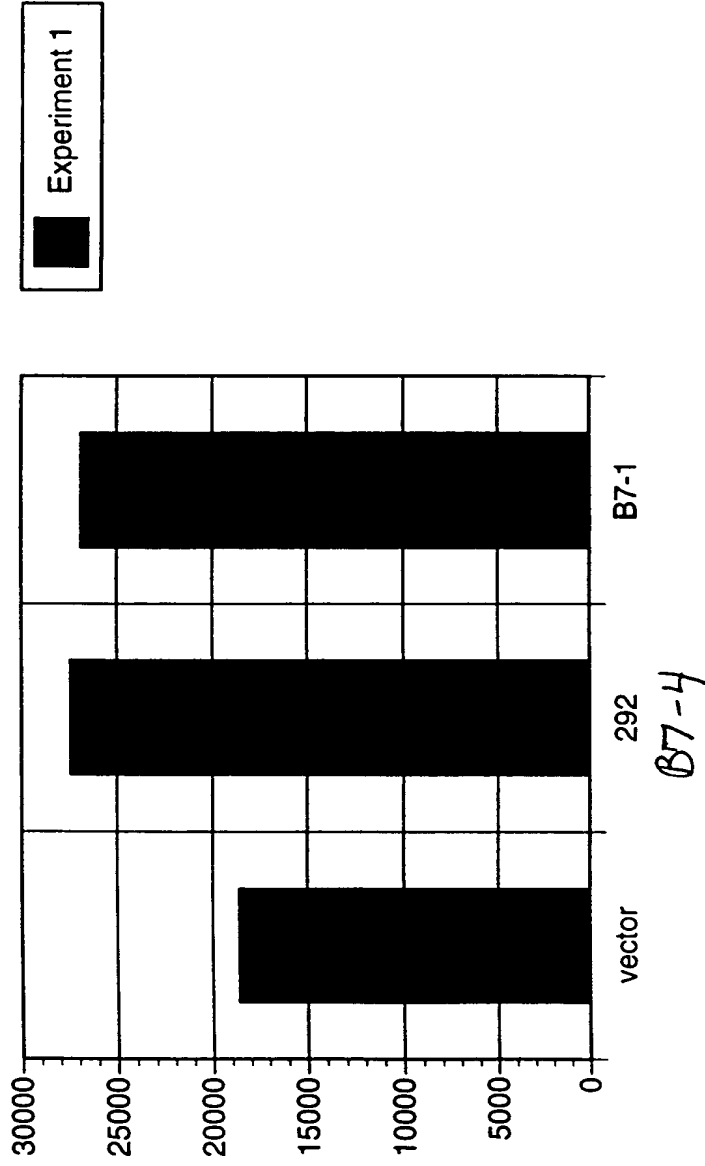


FIGURE 11

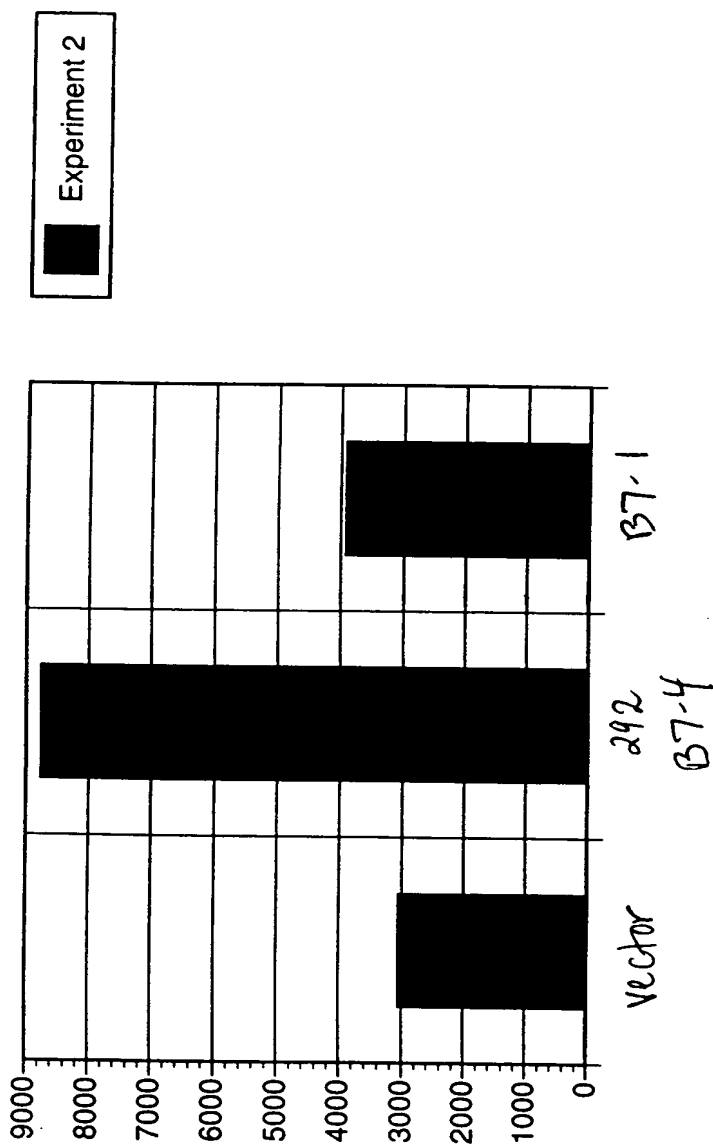


FIGURE 12